EXAMPLE: Calculating the area of seafood cover

The following diagram shows "typical" radial transects set 30 degrees apart. Points of measurement are at 15-foot intervals along the transects. There is continuous seafood cover in the inner area, and discontinuous seafood cover in the outer area, but the two areas easily could be reversed.

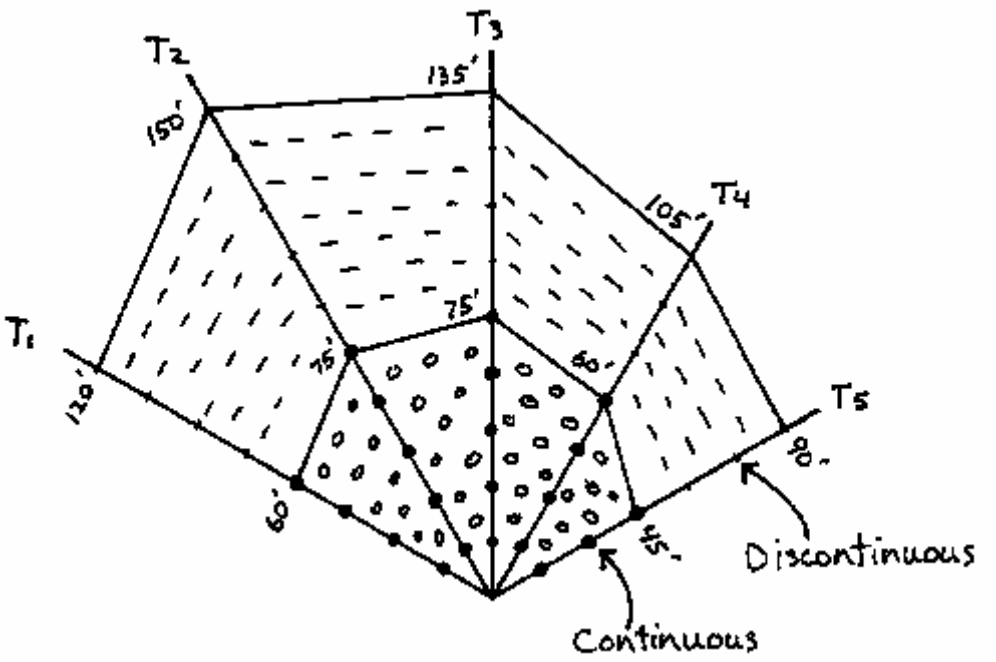

Figure 1

The continuous-cover area is calculated as the sum of the four continuous-cover triangles between transects.

In the discontinuous-cover area smaller individual seafood waste piles must be measured independently. The survey must use a deposition which is 0.5 inch or thicker on the bottom (seafloor) as the minimum detection level.

Monitoring must provide a determination of the outer boundary of the area of the waste deposited on the bottom. All areas of deposited seafood processing waste must be measured and added together to calculate the total area of deposited seafood processing waste (VI.C.3.b).

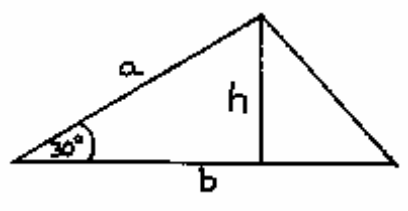

Figure 2

The formula for the area of any triangle is *1/2 x base x height*, or *1/2 bh*. The long side of the triangle is viewed as the base. The height is a vertical line perpendicular to the base. Fortunately, in a 30-degree triangle, the height is equal to 1/2 the length of the upper side adjacent to the 30-degree angle, or *1/2 a*. Substituting *1/2 a* for *h* means that the area of a 30-degree triangle is equal to *ab/4*. This makes it easy to calculate areas between transects, based on the various transect segment lengths.

h = 1/2 a Area = 1/2 bh = 1/2 b x 1/2 a = ab/4

In the following example, the five transects left to right are labeled as T_1, T_2, T_3, T_4, T_5. The transect lengths are shown for the continuous cover area (CC):

	T_1	T_2	T_3	T_4	T_5
CC:	**60'**	**75'**	**75'**	**60'**	**45'**

Find the CC area by calculating the area of each of the four triangles, then adding those four areas. The area of the first CC triangle is *60 x 75 / 4*, or *1125 square feet*. The table of calculations follows (values are rounded to the nearest whole number).

60 x 75 / 4 = 1125 ft^2

75 x 75 / 4 = 1406 ft^2

75 x 60 / 4 = 1125 ft^2

60 x 45 / 4 = 675 ft^2

4331 ft^2, continuous cover area

To convert any of the areas to acres, divide by 43,560 ft2/acre.

Continuous cover: 4,331 ft2 / 43,560 ft2/acre = 0.10 acre

A similar method can be used to calculate continuous cover if there is discontinuous cover inside of the continuous cover. The diagram would be similar to that above, but with continuous cover farther from shore and discontinuous cover near shore. In that case, calculate the inner discontinuous area, and subtract the inner discontinuous area from the total area of continuous plus inner discontinuous area. If there is additional discontinuous area beyond the continuous area (farther from shore), subtract the continuous area from the total survey area to get the sum of the inner and outer discontinuous areas.

To aid in calculation, the tables on the next page provide triangle areas in square feet, rounded to the nearest whole number, for various transect lengths (triangle sides). The first table is based on 15-foot measurement intervals (preferred!). The second table is based on 5-meter intervals (16.4 feet, sometimes used previously). Select one transect length from the top row, e.g., 150 feet. Select the other transect length from the left column, e.g., 135 feet. The triangle area, *150' x 135' / 4 = 5063 ft2*, is found in the table at the intersection of the 150' column and the 135' row.

A computer spreadsheet may be constructed to handle calculations for typical situations.

Other methods may be used to calculate area, including computer mapping, planimeter, and dot grids. The method used must be described in the seafood monitoring report to a degree that allows DEC and EPA to check the calculation.